AMALGAMATED SUGAR-PAUL PLANT(PWS 5340002)
SOURCE WATER ASSESSMENT FINAL REPORT

April 25, 2002

State of Idaho
Department of Environmental Quality

Executive Summary

Under the Safe Drinking Water Act Amendments of 1996, all states are required by the U.S. Environmental Protection Agency (EPA) to assess every source of public drinking water for its relative sensitivity to contaminants regulated by the act. This assessment is based on a land use inventory of the designated assessment area, sensitivity factors associated with the wells, and aquifer characteristics.

This report, *Source Water Assessment for the Amalgamated Sugar Co., Paul, Idaho* describes the public drinking water system, the boundaries of the zones of water contribution, and the associated potential contaminant sources located within these boundaries. This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. **The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

Final susceptibility scores are derived from equally weighting system construction scores, hydrologic sensitivity scores, and potential contaminant/land use scores. Therefore, a low rating in one or two categories coupled with a higher rating in other categories results in a final rating of low, moderate, or high susceptibility. With the potential contaminants associated with most urban and heavily agricultural areas, the best score a well can get is moderate. Potential contaminants are divided into four categories, inorganic contaminants (IOCs, i.e. nitrates, arsenic), volatile organic contaminants (VOCs, i.e. petroleum products), synthetic organic contaminants (SOCs, i.e. pesticides), and microbial contaminants (i.e. bacteria). As different wells can be subject to various contamination settings, separate scores are given for each type of contaminant.

The Amalgamated Sugar Co. of Paul (PWS 5340002) drinking water system consists of one ground water well source. The well has a moderate susceptibility rating to inorganic, volatile organic, synthetic organic, and microbial contamination. The wastewater land application (WLAP) site, numerous leaking underground storage tanks (LUSTs), underground storage tanks (USTs), transportation routes, and the predominant irrigated agricultural land use contributed the most points to the susceptibility rating.

The inorganic contaminants (IOCs) barium, fluoride, cyanide, and mercury were detected in water samples collected from the well at concentrations below Maximum Contaminant Levels (MCLs). Nitrate levels in the well have been consistently below 1.0 milligram per liter (mg/L). The MCL for nitrate is 10 mg/L. No synthetic organic contaminants (SOCs) have been detected in the well. Total coliform bacteria were detected in the distribution system in July 1994, February 1995, April 1995, and February 1997.

This assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what ranking a source receives, protection is always important. Whether the source is currently located in a "pristine" area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources. If the system should need to expand in the future, new well sites should be located in areas with as few potential sources of contamination as possible, and the site should be reserved and protected for this specific use.

For the Amalgamated Sugar Co. of Paul, drinking water protection activities should first focus on maintaining the requirements of the Sanitary Survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system's components and its capacity). Any spills from the potential contaminant sources listed in Table 2, Appendix A of this report should be carefully monitored, as should any future development in the delineated areas. Most of the designated areas are outside the direct jurisdiction of the Amalgamated Sugar plant of Paul. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Also, disinfection practices should be maintained if microbial contamination becomes a problem. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Partnerships with state and local agencies and industry groups should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation is near urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. As there are transportation corridors near the delineation, the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the Idaho Department of Environmental Quality or the Idaho Rural Water Association.

SOURCE WATER ASSESSMENT FOR AMALGAMATED SUGAR PAUL, IDAHO

Section 1. Introduction - Basis for Assessment

The following sections contain information necessary to understand how and why this assessment was conducted. **It is important to review this information to understand what the ranking of this source means.** A map showing the delineated source water assessment area and the inventory of significant potential sources of contamination identified within that area are attached. The list of significant potential contaminant source categories and their rankings, used to develop this assessment, is also attached.

Level of Accuracy and Purpose of the Assessment

The Idaho Department of Environmental Quality (DEQ) is required by the EPA to assess the over 2,900 public drinking water sources in Idaho for their relative susceptibility to contaminants regulated by the Safe Drinking Water Act. This assessment is based on a land use inventory of the delineated assessment area, sensitivity factors associated with the wells, and aquifer characteristics. All assessments must be completed by May of 2003. The resources and time available to accomplish assessments are limited. Therefore, an in-depth, site-specific investigation to identify each significant potential source of contamination for every public water system is not possible. **This assessment should be used as a planning tool, taken into account with local knowledge and concerns, to develop and implement appropriate protection measures for this source. The results should <u>not be</u> used as an absolute measure of risk and they should <u>not be</u> used to undermine public confidence in the water system.**

The ultimate goal of this assessment is to provide data to local communities to develop a protection strategy for their drinking water supply system. The DEQ recognizes that pollution prevention activities generally require less time and money to implement than treating a public water supply system once it has been contaminated. DEQ encourages communities to balance resource protection with economic growth and development. The decision as to the amount and types of information necessary to develop a drinking water protection program should be determined by the local community based on its own needs and limitations. Drinking water protection is one facet of a comprehensive growth plan, and it can complement ongoing local planning efforts.

Section 2. Conducting the Assessment

General Description of the Source Water Quality

The Amalgamated Sugar Co. drinking water system is a non-transient system that consists of one ground water well that serves approximately 200 people through 1connection. The well is located about 1/2 mile north of Highway 25, approximately one mile northeast of Paul, and approximately 3 miles west of Rupert in an agricultural area (Figure 1). The water from this well is pumped to a 1,000-gallon pressure tank, where it is chlorinated using a positive displacement pump that injects a sodium hypochlorite solution into the tank. The water is chlorinated to approximately 2.5 to 4 parts per million (ppm) total chlorine residual. From the pressure tank, the water is distributed to restrooms and the chemistry lab. Water fountains in the plant have been removed and bottled water is provided for drinking.

No water chemistry issues have been recorded in the public water system thus far. Barium, fluoride, cyanide, mercury, and nitrate were detected in water samples collected from the well at concentrations far below the current MCLs. No SOCs have been detected in the well. However, total coliform bacteria have been detected in the distribution system in July 1994, February 1995, April 1995, and February 1997. Countywide nitrogen fertilizer use, county level herbicide use, and total county level agricultural chemical use are rated as high for the area. Additionally, the delineation crosses a nitrate priority area.

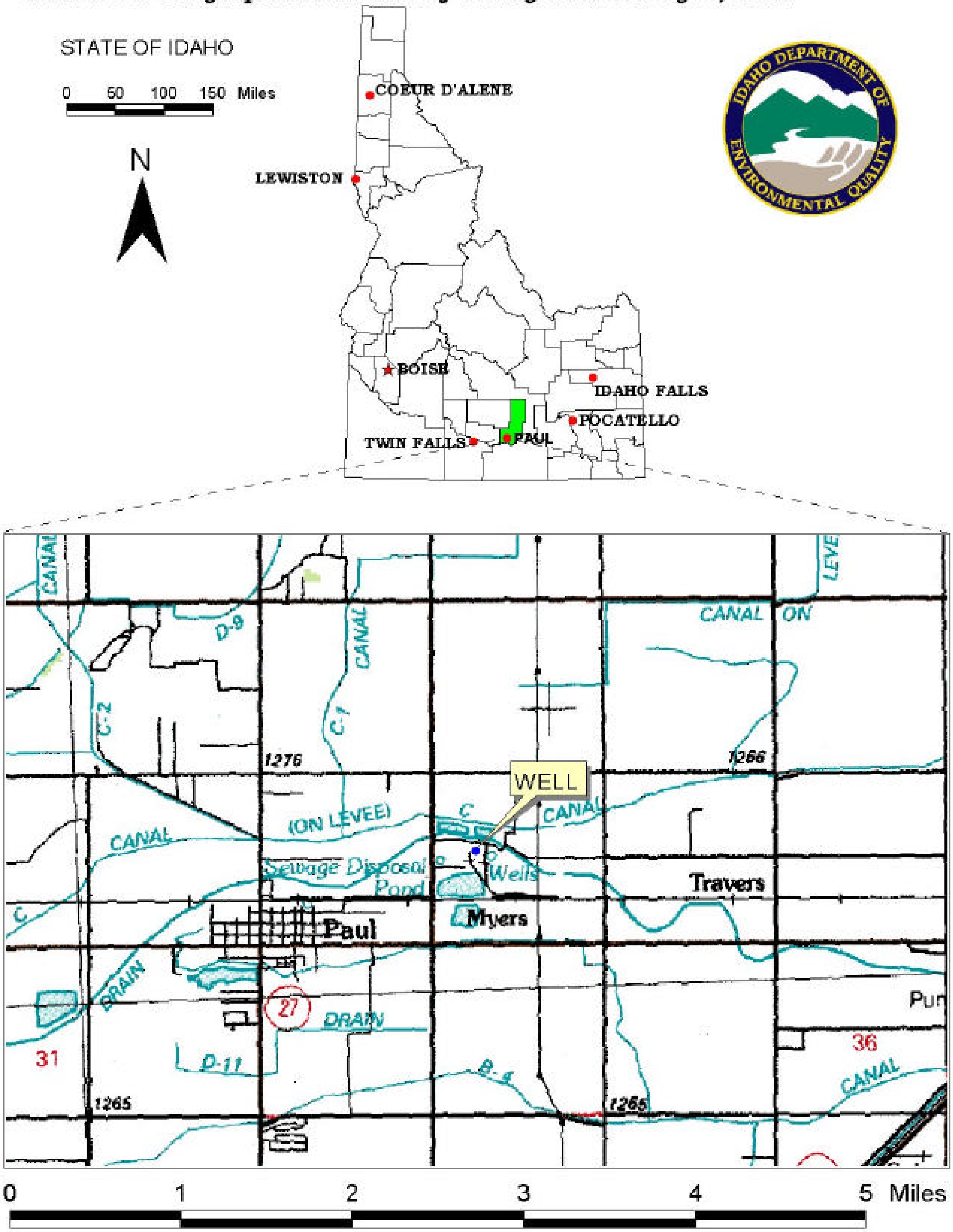
Defining the Zones of Contribution – Delineation

The delineation process establishes the physical area around a well that will become the focal point of the assessment. The process includes mapping the boundaries of the zone of contribution into time-of-travel zones (zones indicating the number of years necessary for a particle of water to reach a well) for water in the aquifer. Washington Group, International (WGI) used a refined computer model approved by the EPA in determining the time-of-travel (TOT) zones for water associated with the Southwest Eastern Snake River Plain (SW ESRP) aquifer. The computer model used site-specific data, assimilated by DEQ and WGI from a variety of sources including local area well logs and hydrogeologic reports summarized below.

The ESRP is a northeast trending basin located in southeastern Idaho. The 10,000 square miles of the plain are filled primarily with highly fractured layered Quaternary basalt flows of the Snake River Group, which are intercalated with sedimentary rocks along the margins (Garabedian, 1992, p. 5). Individual basalt flows range from 10 to 50 feet thick, averaging 20 to 25 feet thick (Lindholm, 1996, p. 14). Basalt is thickest in the central part of the eastern plain and thins toward the margins. Whitehead (1992, p. 9) estimates the total thickness of the flows to be as great as 5,000 feet. A thin layer (0 to 100 feet) of windblown and fluvial sediments overlies the basalt.

The layered basalts of the Snake River Group host one of the most productive aquifers in the United States. The aquifer is generally considered unconfined, yet may be confined locally because of interbedded clay and dense unfractured basalt (Whitehead, 1992, p. 26). Whitehead (1992, p. 22) reports that well yields of 2,000 to 3,000 gal/min are common for wells open to less than 100 feet of the aquifer. Lindholm (1996, p. 18) estimates aquifer thickness to range from 100 feet near the plain's margin to thousands of feet near the center. Models of the regional aquifer have used values ranging from 200 to 3,000 feet to represent aquifer thickness (Cosgrove et al., 1999, p. 15).

FIGURE 1. Geographic Location of Amalgamated Sugar, Paul



Regional ground-water flow is to the southwest paralleling the basin (Cosgrove et al., 1999; deSonneville, 1972, p. 78; Garabedian, 1992, p. 48; and Lindholm, 1996, p. 23). Reported water table gradients range from 3 to 100 ft/mile and average 12 ft/mile (Lindholm, 1996, p. 22). Gradients steepen at the plain's margin and at discharge locations.

The majority of aquifer recharge results from surface water irrigation activities (incidental recharge), which divert water from the Snake River and its tributaries (Ackerman, 1995, p. 4, and Garabedian, 1992, p. 11). Natural recharge occurs through stream losses, direct precipitation, and tributary basin underflow.

The Southwest Margin of the ESRP hydrologic province is the regional aquifer's primary discharge area. Interpretation of well logs indicates that a 1- to 23-foot-thick layer of sediment overlies the fractured basalt aquifer in Jerome County, and that an 8- to 410-foot-thick layer of sediment overlies the same aquifer in southern Minidoka and Power Counties. Published geologic maps of the Snake River Plain (Whitehead 1992, Plates 1 and 5) indicate there is 100 to 500 feet of Quaternary to Tertiary Basalt aged compacted to poorly consolidated sediments located in the Heyburn area (north of the Snake River near Burley). The saturated thickness of the regional basalt aquifer for the Southwest Margin is estimated to range from less than 500 feet near the Snake River to 1,500 feet near Minidoka.

A published water table map of the Kimberly to Bliss region of the aquifer (Moreland, 1976, p. 5) indicates that the ground-water flow direction in the Southwest Margin is similar to that depicted at the regional scale (e.g., Garabedian, 1992, Plate 4).

Annual average precipitation for the period 1951 to 1980 is 9.6 inches in both Twin Falls and Burley (Kjelstrom, 1995, p. 3). The estimated recharge from precipitation in the Southwest Margin ranges from less than 0.5 inch to more than 2 in./yr (Garabedian, 1992, p. 20). Kjelstrom (1995, p. 13) reports an annual river loss of 110,000 acre-feet to the aquifer for the 34.8-mile Minidoka-to-Milner reach of the Snake River. River gains of 210,000 acre-feet for the 21.5-mile Milner-to-Kimberly reach, and 880,000 acre-feet for the 20.4-mile Kimberly-to-Buhl reach are reported for the same period.

The delineated source water assessment area for the Amalgamated Sugar Co., Paul Plant well can best be described as a pie-slice shaped area that extends about 7 miles east-southeast from the wellhead, ending at the Snake River (Figures 2 and 3, Appendix A). The actual data used by WGI in determining the source water assessment delineation area is available from DEQ upon request.

Identifying Potential Sources of Contamination

A potential source of contamination is defined as any facility or activity that stores, uses, or produces, as a product or by-product, the contaminants regulated under the Safe Drinking Water Act and has a sufficient likelihood of releasing such contaminants at levels that could pose a concern relative to drinking water sources. The goal of the inventory process is to locate and describe those facilities, land uses, and environmental conditions that are potential sources of ground water contamination. The locations of potential sources of contamination within the delineation areas were obtained by field surveys conducted by DEQ and the Amalgamated Sugar-Paul and from available databases.

The dominant land use outside the Amalgamated Sugar Co. Paul Plant area is irrigated agricultural land, residential property in Rupert (east of the plant) and residential property in Paul (west of the plant). Land use within the immediate area of the wellhead consists of agriculture.

It is important to understand that a release may never occur from a potential source of contamination provided best management practices are used at the facility. Many potential sources of contamination are regulated at the federal level, state level, or both, to reduce the risk of release. Therefore, when a business, facility, or property is identified as a potential contaminant source, this should not be interpreted to mean that this business, facility, or property is in violation of any local, state, or federal environmental law or regulation. What it does mean is that the potential for contamination exists due to the nature of the business, industry, or operation. There are a number of methods that water systems can use to work cooperatively with potential sources of contamination, such as educational visits and inspections of stored materials. Many owners of such facilities may not even be aware that they are located near a public water supply well.

Contaminant Source Inventory Process

A contaminant inventory of the study area was conducted in June and July of 2001. This involved identifying and documenting potential contaminant sources within the Amalgamated Sugar Co., Paul Plant Source Water Assessment Areas through the use of computer databases and Geographic Information System (GIS) maps developed by DEQ.

The delineation (Table 2, Figures 2 and 3 in Appendix A) of the well has 109 potential point sources. These potential contaminant sources include several leaking underground storage tanks (LUSTs), underground storage tanks (USTs), multiple dairies, numerous auto sales and repair shops, gas/service stations, some feed and fertilizer dealers, a landfill, a septic tank cleaning service, and a wastewater land application (WLAP) site.

Highway 25 crosses the delineation in the 3-year TOT and Highway 24/30 crosses the delineation in the 6-year TOT are major transportation corridors within the Amalgamated Sugar plant area. If an accidental spill occurred in any of these sources, IOCs, VOCs, SOCs, or microbial contaminants could be added to the aquifer system. The Snake River is a major surface water source that crosses the delineation in the 10-year TOT. It could potentially contaminate the aquifer by surface runoff.

Section 3. Susceptibility Analyses

The water system's susceptibility to contamination was ranked as high, moderate, or low risk according to the following considerations: hydrologic characteristics, physical integrity of the well, land use characteristics, and potentially significant contaminant sources. The susceptibility rankings are specific to a particular potential contaminant or category of contaminants. Therefore, a high susceptibility rating relative to one potential contaminant does not mean that the water system is at the same risk for all other potential contaminants. The relative ranking that is derived for each well is a qualitative, screening-level step that, in many cases, uses generalized assumptions and best professional judgement. Appendix B contains the susceptibility analysis worksheets. The following summaries describe the rationale for the susceptibility ranking.

Hydrologic Sensitivity

The hydrologic sensitivity of a well is dependent upon four factors: the surface soil composition, the material in the vadose zone (between the land surface and the water table), the depth to first ground water, and the presence of a 50-foot thick fine-grained zone above the producing zone of the well. Slowly draining soils such as silt and clay typically are more protective of ground water than coarse-grained soils such as sand and gravel. Similarly, fine-grained sediments in the subsurface and a water depth of more than 300 feet protect the ground water from contamination.

The hydrologic sensitivity was low for the well (Table 2). This reflects the poor to moderately-drained nature of the soil which reduces the downward movement of contaminants, the mostly clay make-up of the vadose zone and the presence of a 50-foot thick fine-grained sediment layer above the producing zone of the well.

Well Construction

Well construction directly affects the ability of the well to protect the aquifer from contaminants. System construction scores are reduced when information shows that potential contaminants will have a more difficult time reaching the intake of the well. Lower scores imply a system is less vulnerable to contamination. For example, if the well casing and annular seal both extend into a low permeability unit, then the possibility of contamination is reduced and the system construction score goes down. If the highest production interval is more than 100 feet below the water table, then the system is considered to have better buffering capacity. If the wellhead and surface seal are maintained to standards, as outlined in Sanitary Surveys, then contamination down the well bore is less likely. If the well is protected from surface flooding and is outside the 100-year floodplain, then contamination from surface events is reduced.

The Amalgamated Sugar Co., Paul Plant drinking water system consists of one well that extracts ground water for culinary use. The well rated moderate susceptibility for system construction (Table 2). The 1995 Sanitary Survey indicates that the wellhead and surface seals are maintained to standards and that the well is protected from surface flooding. The well, installed in 1953, consists of a 10-inch casing followed by an 8-inch casing set to approximately 500 feet below ground surface (bgs) into fine sand. The static water level is at 200 feet bgs. Though the Amalgamated Sugar plant well may have met construction standards at the time of its installation, current well construction standards are stricter.

The Idaho Department of Water Resources *Well Construction Standards Rules* (1993) require all Public Water Systems (PWSs) to follow DEQ standards as well. IDAPA 58.01.08.550 requires that PWSs follow the *Recommended Standards for Water Works* (1997) during construction. Some of the requirements include casing thickness, well tests, and depth and formation type that the surface seal must be installed into. Table 1 of the *Recommended Standards for Water Works* (1997) lists the required steel casing thickness for various diameter wells. Ten-inch diameter wells require a casing thickness of at least 0.365 inches and eight-inch diameter wells require a casing thickness of at least 0.322-inches. Well tests are required at the design pumping rate for 24 hours or until stabilized drawdown has continued for at least six hours when pumping at 1.5 times the design pumping rate.

Potential Contaminant Source and Land Use

The well rated high for IOCs (e.g. arsenic, nitrate), VOCs (e.g. petroleum products), and SOCs (e.g. pesticides), and low for microbial contaminants (e.g. bacteria). The wastewater land application (WLAP) site, the LUSTs, and the USTs can possibly contribute leachable contaminants to the aquifer. The local transportation corridors and the predominant irrigated agricultural land contributed the largest number of points to the contaminant inventory rating. County level nitrogen fertilizer use, county level herbicide use, and total county level agricultural chemical use are rated as high for the well. The delineation also crosses a nitrate priority area.

Final Susceptibility Rating

An IOC detection above a drinking water standard MCL, any detection of a VOC or SOC, or a detection of total coliform bacteria or fecal coliform bacteria at the wellhead will automatically give a high susceptibility rating to a well, despite the land use of the area, because a pathway for contamination already exists. Additionally, the storage or application of any potential contaminants within 50 feet of the wellhead will lead to an automatic high score. Hydrologic sensitivity and system construction scores are heavily weighted in the final scores. Having multiple potential contaminant sources in the 0- to 3-year time-of-travel zone (Zone 1B) and much agricultural land contribute greatly to the overall ranking. In terms of total susceptibility, the well rates moderate for all potential contaminant categories (Table 1).

Table 1. Summary of the Amalgamated Sugar-Paul Susceptibility Evaluation

	Susceptibility Scores[1]						**Final Susceptibility Ranking**			
	Hydrologic Sensitivity	Contaminant Inventory				System Construction				
Source		IOC	VOC	SOC	Microbials		IOC	VOC	SOC	Microbials
Well #1	L	H	H	H	L	M	M	M	M	M

[1]H = High Susceptibility, M = Moderate Susceptibility, L = Low Susceptibility
IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Susceptibility Summary

In terms of total susceptibility, the well rated moderate for all potential contaminant categories. The WLAP, LUST, and UST sites as well as the local transportation corridors and the irrigated agricultural land contributed greatly to the overall susceptibility of the well.

No water chemistry issues have been recorded in the public water system thus far. Barium, fluoride, cyanide, mercury, and nitrate were detected in water samples collected from the well at concentrations far below the current MCLs. No SOCs have been detected in the well. Total coliform bacteria have been detected in the distribution system in July 1994, February 1995, April 1995, and February 1997. Countywide nitrogen fertilizer use, county level herbicide use, and total county level agricultural chemical use are rated as high for the area. Additionally, the delineation crosses a nitrate priority area.

Section 4. Options for Drinking water protection

The susceptibility assessment should be used as a basis for determining appropriate new protection measures or re-evaluating existing protection efforts. No matter what the susceptibility ranking a source receives, protection is always important. Whether the source is currently located in a “pristine” area or an area with numerous industrial and/or agricultural land uses that require surveillance, the way to ensure good water quality in the future is to act now to protect valuable water supply resources.

An effective drinking water protection program is tailored to the particular local drinking water protection area. A community with a fully developed drinking water protection program will incorporate many strategies, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For The Amalgamated Sugar Co., Paul Plant, drinking water protection activities should first focus on maintaining the requirements of the Sanitary Survey (an inspection conducted every five years with the purpose of determining the physical condition of a water system’s components and its capacity). Any spills from the potential contaminant sources listed in Table 2, Appendix A of this report should be carefully monitored, as should any future development in the delineated areas. Most of the designated areas are outside the direct jurisdiction of the Amalgamated Sugar Co., Paul Plant. Other practices aimed at reducing the leaching of agricultural chemicals from agricultural land within the designated source water areas should be implemented. Also, disinfection practices should be maintained if microbial contamination becomes a problem. No chemicals should be stored or applied within the 50-foot radius of the wellhead. Partnerships with state and local agencies and industry groups should be established and are critical to success.

Due to the time involved with the movement of ground water, drinking water protection activities should be aimed at long-term management strategies even though these strategies may not yield results in the near term. A strong public education program should be a primary focus of any drinking water protection plan as the delineation is near urban and residential land uses. Public education topics could include proper lawn and garden care practices, household hazardous waste disposal methods, proper care and maintenance of septic systems, and the importance of water conservation to name but a few. There are multiple resources available to help communities implement protection programs, including the Drinking Water Academy of the EPA. There are transportation corridors within the delineation, therefore, the State Department of Transportation should be involved in protection activities. Drinking water protection activities for agriculture should be coordinated with the Idaho State Department of Agriculture, the Soil Conservation Commission, the local Soil Conservation District, and the Natural Resources Conservation Service.

A system must incorporate a variety of strategies in order to develop a comprehensive drinking water protection plan, be they regulatory in nature (i.e. zoning, permitting) or non-regulatory in nature (i.e. good housekeeping, public education, specific best management practices). For assistance in developing protection strategies please contact the Twin Falls Regional Office of the DEQ or the Idaho Rural Water Association.

Assistance

Public water suppliers and others may call the following DEQ offices with questions about this assessment and to request assistance with developing and implementing a local protection plan. In addition, draft protection plans may be submitted to the DEQ office for preliminary review and comments.

Twin Falls Regional DEQ Office	(208) 736-2190
State DEQ Office	(208) 373-0502

Website: http://www.deq.state.id.us

Water suppliers serving fewer than 10,000 persons may contact Melinda Harper, (mlharper@idahoruralwater.com) Idaho Rural Water Association, at (208) 343-7001 for assistance with drinking water protection (formerly wellhead protection) strategies.

POTENTIAL CONTAMINANT INVENTORY
LIST OF ACRONYMS AND DEFINITIONS

AST (Aboveground Storage Tanks) – Sites with aboveground storage tanks.

Business Mailing List – This list contains potential contaminant sites identified through a yellow pages database search of standard industry codes (SIC).

CERCLIS – This includes sites considered for listing under the **Comprehensive Environmental Response Compensation and Liability Act (CERCLA)**. CERCLA, more commonly known as ASuperfund≅ is designed to clean up hazardous waste sites that are on the national priority list (NPL).

Cyanide Site – DEQ permitted and known historical sites/facilities using cyanide.

Dairy – Sites included in the primary contaminant source inventory represent those facilities regulated by Idaho State Department of Agriculture (ISDA) and may range from a few head to several thousand head of milking cows.

Deep Injection Well – Injection wells regulated under the Idaho Department of Water Resources generally for the disposal of stormwater runoff or agricultural field drainage.

Enhanced Inventory – Enhanced inventory locations are potential contaminant source sites added by the water system. These can include new sites not captured during the primary contaminant inventory, or corrected locations for sites not properly located during the primary contaminant inventory. Enhanced inventory sites can also include miscellaneous sites added by the Idaho Department of Environmental Quality (DEQ) during the primary contaminant inventory.

Floodplain – This is a coverage of the 100year floodplains.

Group 1 Sites – These are sites that show elevated levels of contaminants and are not within the priority one areas.

Inorganic Priority Area – Priority one areas where greater than 25% of the wells/springs show constituents higher than primary standards or other health standards.

Landfill – Areas of open and closed municipal and non-municipal landfills.

LUST (Leaking Underground Storage Tank) – Potential contaminant source sites associated with leaking underground storage tanks as regulated under RCRA.

Mines and Quarries – Mines and quarries permitted through the Idaho Department of Lands.

Nitrate Priority Area – Area where greater than 25% of wells/springs show nitrate values above 5mg/l.

NPDES (National Pollutant Discharge Elimination System) – Sites with NPDES permits. The Clean Water Act requires that any discharge of a pollutant to waters of the United States from a point source must be authorized by an NPDES permit.

Organic Priority Areas – These are any areas where greater than 25 % of wells/springs show levels greater than 1% of the primary standard or other health standards.

Recharge Point – This includes active, proposed, and possible recharge sites on the Snake River Plain.

RICRIS – Site regulated under **Resource Conservation Recovery Act (RCRA)**. RCRA is commonly associated with the cradle to grave management approach for generation, storage, and disposal of hazardous wastes.

SARA Tier II (Superfund Amendments and Reauthorization Act Tier II Facilities) – These sites store certain types and amounts of hazardous materials and must be identified under the Community Right to Know Act.

Toxic Release Inventory (TRI) – The toxic release inventory list was developed as part of the Emergency Planning and Community Right to Know (Community Right to Know) Act passed in 1986. The Community Right to Know Act requires the reporting of any release of a chemical found on the TRI list.

UST (Underground Storage Tank) – Potential contaminant source sites associated with underground storage tanks regulated as regulated under RCRA.

Wastewater Land Applications Sites – These are areas where the land application of municipal or industrial wastewater is permitted by DEQ.

Wellheads – These are drinking water well locations regulated under the Safe Drinking Water Act. They are not treated as potential contaminant sources.

NOTE: Many of the potential contaminant sources were located using a geocoding program where mailing addresses are used to locate a facility. Field verification of potential contaminant sources is an important element of an enhanced inventory.

Where possible, a list of potential contaminant sites unable to be located with geocoding will be provided to water systems to determine if the potential contaminant sources are located within the source water assessment area.

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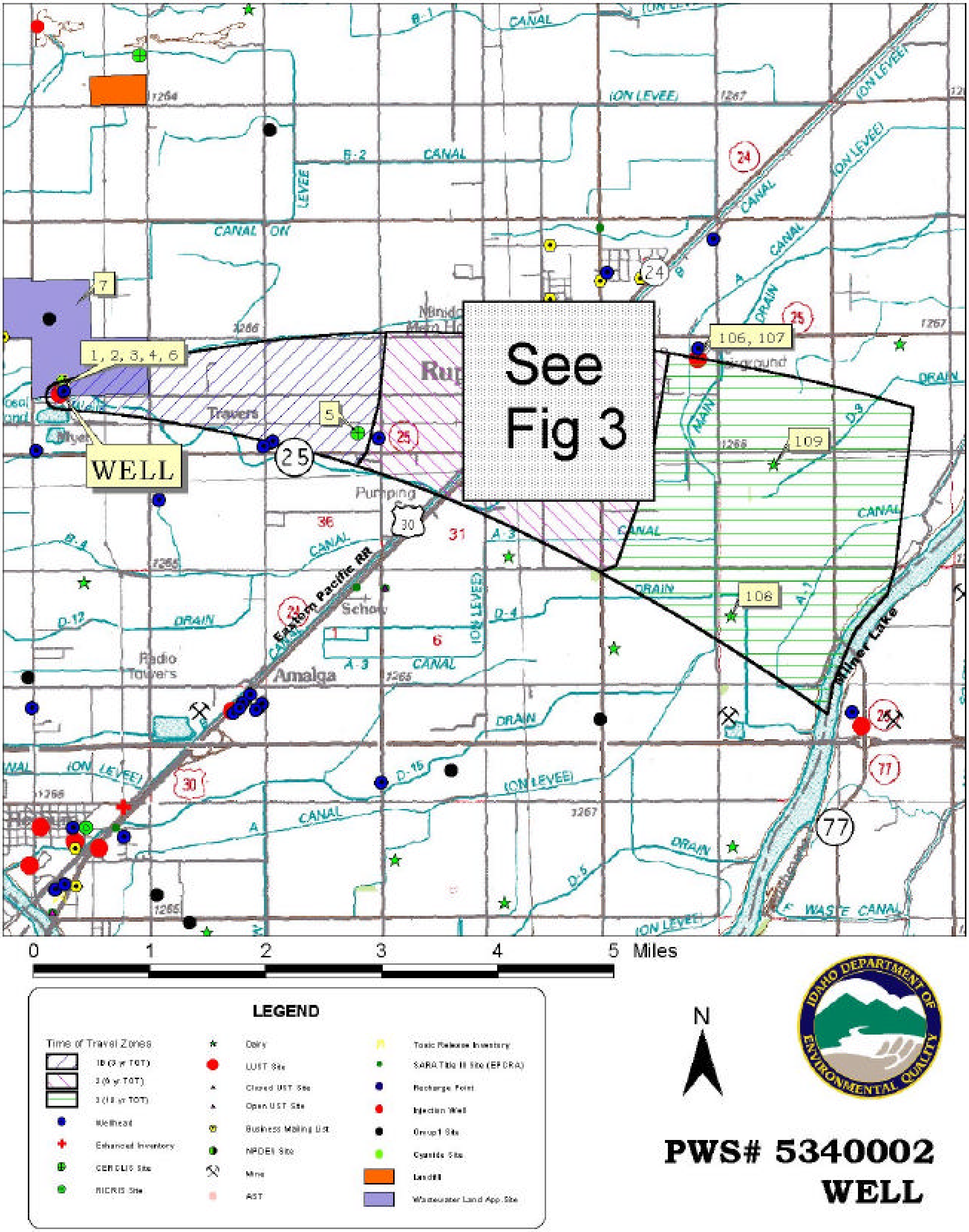
Appendix A

Amalgamated Sugar Plant, Paul
Figure 2, Figure 3, and Potential Contaminant Inventory Table

Figure 2. Amalgamated Sugar Paul Delineation Map and Potential Contaminant Source Locations



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WELL

Figure 3. Amalgamated Sugar Paul Delineation Map and Potential Contaminant Source Locations

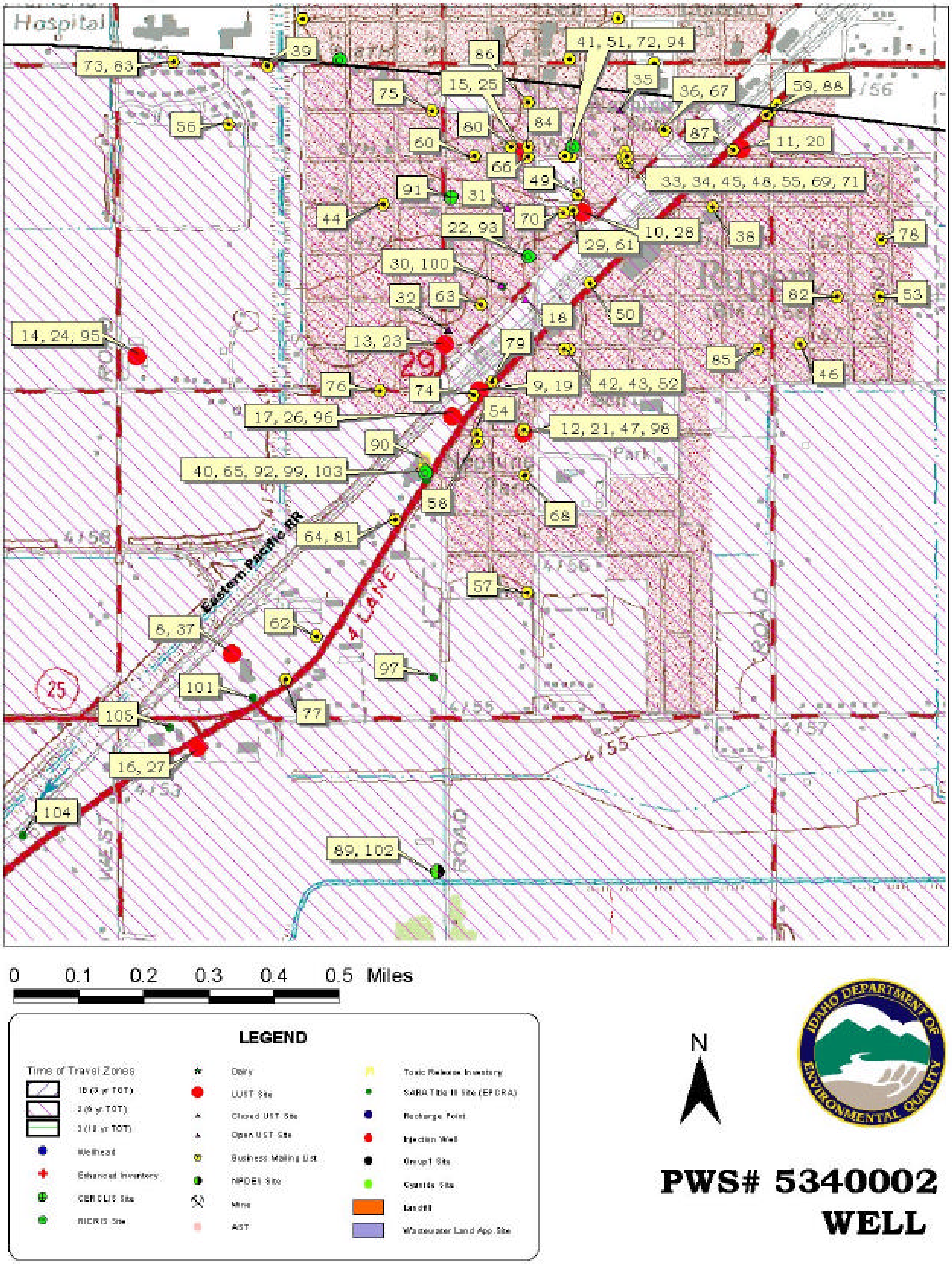

Table 2. Amalgamated Sugar-Paul Well. Potential Contaminant Inventory.

Site	Source Description[1]	TOT[2] Zone	Source of Information	Potential Contaminants[3]
1, 2	LUST - Site Cleanup Completed , Impact: Unknown; UST - Closed	0-3	Database Search	VOC, SOC
3, 4, 6	npdes - INDUSTRIAL discharge; TRI; SARA - BEET SUGAR	0-3	Database Search	VOC, SOC
5	cercla - ARPT :Permit Holder	0-3	Database Search	IOC, VOC, SOC, Microbials
7	wlap	0-3	Database Search	IOC, VOC, SOC, Microbials
8, 37	LUST - Site Cleanup Incomplete , Impact: GROUND WATER; UST - Closed	3-6	Database Search	VOC, SOC
9, 19	LUST - Site Cleanup Completed , Impact: Unknown; UST - Closed	3-6	Database Search	VOC, SOC
10, 28	LUST - Site Cleanup Incomplete , Impact: GROUND WATER; UST - Closed	3-6	Database Search	VOC, SOC
11, 20	LUST - Site Cleanup Completed , Impact: Unknown; UST - Closed	3-6	Database Search	VOC, SOC
12, 21, 47, 98	LUST - Site Cleanup Incomplete , Impact: GROUND WATER; UST - Open; Oils-Fuel (Wholesale); SARA - PETROLEUM BULK STATIONS & TERM	3-6	Database Search	VOC, SOC
13, 23	LUST - Site Cleanup Completed , Impact: Unknown; UST - Closed	3-6	Database Search	VOC, SOC
14, 24, 95	LUST - Site Cleanup Completed , Impact: Unknown; UST - Open; SARA	3-6	Database Search	VOC, SOC
15, 25	LUST - Site Cleanup Completed , Impact: Unknown; UST - Closed	3-6	Database Search	VOC, SOC
16, 27	LUST - Site Cleanup Completed , Impact: Unknown; UST - Open	3-6	Database Search	VOC, SOC
17, 26, 96	LUST - Site Cleanup Completed , Impact: Unknown; UST - Open;SARA	3-6	Database Search	VOC, SOC
18	UST - Open	3-6	Database Search	VOC, SOC
22, 93	UST - Closed; rcris	3-6	Database Search	VOC, SOC
29	UST - Closed	3-6	Database Search	VOC, SOC
30, 100	UST - Open; SARA	3-6	Database Search	VOC, SOC
31	UST - Open	3-6	Database Search	VOC, SOC
32	UST - Closed	3-6	Database Search	VOC, SOC
33, 71	UST - Closed; Truck Equipment & Parts-Wholesale	3-6	Database Search	IOC, VOC, SOC
34	UST - Closed	3-6	Database Search	VOC, SOC
35	UST - Closed	3-6	Database Search	VOC, SOC
36, 67	UST - Closed; Tire-Dealers-Retail	3-6	Database Search	VOC, SOC
38	Hardware-Retail	3-6	Database Search	VOC, SOC
39	Aerial Applicators	3-6	Database Search	IOC, VOC, SOC
40, 92	Oils-Fuel (Wholesale); rcris	3-6	Database Search	IOC, VOC, SOC
41	Photographers-Portrait	3-6	Database Search	IOC, VOC
42	Motorcycles & Motor Scooters-Rpr	3-6	Database Search	IOC, VOC, SOC
43	Automobile Body-Repairing & Painting	3-6	Database Search	IOC, VOC, SOC
44	Painters	3-6	Database Search	IOC, VOC, SOC
45	Automobile Body-Repairing & Painting	3-6	Database Search	IOC, VOC, SOC
46	Automobile Detail & Clean-Up Service	3-6	Database Search	IOC, VOC, SOC

Site	Source Description[1]	TOT[2] Zone	Source of Information	Potential Contaminants[3]
48	Machine Shops	3-6	Database Search	IOC, VOC, SOC
49	Electric Companies	3-6	Database Search	IOC, VOC
50	Railroads	3-6	Database Search	IOC, VOC, SOC
51, 72	Newspapers (Publishers)	3-6	Database Search	IOC, VOC
52	Car Washing & Polishing	3-6	Database Search	IOC, VOC, SOC
53	Feed-Dealers (Wholesale)	3-6	Database Search	IOC, VOC, SOC
54	Automobile Body-Repairing & Painting	3-6	Database Search	IOC, VOC, SOC
55	Wrecker Service	3-6	Database Search	IOC, VOC, SOC
56	Livestock Breeders	3-6	Database Search	IOC
57	Automobile Dealers-New Cars	3-6	Database Search	VOC, SOC
58	Storage-Household & Commercial	3-6	Database Search	IOC, VOC, SOC
59	Bus Lines	3-6	Database Search	IOC, VOC, SOC
60	Funeral Directors	3-6	Database Search	IOC, SOC
61	Automobile Repairing & Service	3-6	Database Search	IOC, VOC, SOC
62	Gasoline-Wholesale	3-6	Database Search	IOC, VOC, SOC
63	Transmissions-Automobile	3-6	Database Search	IOC, VOC, SOC
64	Automobile Dealers-New Cars	3-6	Database Search	VOC, SOC
65, 99	Cheese Processors; SARA - CHEESE, NATURAL AND PROCESSED	3-6	Database Search	IOC, VOC, SOC
66	Automobile Repairing & Service	3-6	Database Search	IOC, VOC, SOC
68	Painters	3-6	Database Search	IOC, VOC, SOC
69	Automobile Parts & Supplies-Wholesale	3-6	Database Search	VOC, SOC
70	Garbage Collection	3-6	Database Search	IOC, VOC, SOC
73, 83	Hospitals; Ambulance Service	3-6	Database Search	IOC, VOC, SOC
74	Service Stations-Gasoline & Oil	3-6	Database Search	IOC, VOC, SOC
75	Trucking-Liquid & Dry Bulk	3-6	Database Search	IOC, VOC, SOC
76	Livestock Breeders	3-6	Database Search	IOC
77	Tire-Dealers-Retail	3-6	Database Search	VOC, SOC
78	Signs (Manufacturers)	3-6	Database Search	IOC, VOC
79	Farm Equipment (Wholesale)	3-6	Database Search	VOC, SOC
80	Commercial Printing NEC	3-6	Database Search	IOC, VOC
81	Automobile Repairing & Service	3-6	Database Search	IOC, VOC, SOC
82	Septic Tanks-Cleaning & Repairing	3-6	Database Search	IOC, SOC
84	Parking Area Maintenance & Marking	3-6	Database Search	IOC, VOC, SOC
85	Home Improvements	3-6	Database Search	VOC, SOC
86	Cleaners	3-6	Database Search	VOC
87	Farm Equipment (Wholesale)	3-6	Database Search	VOC, SOC
88	Farm Equipment-Manufacturers	3-6	Database Search	IOC, VOC, SOC
89, 102	npdes - MUNICIPAL discharge; SARA	3-6	Database Search	IOC
90	TRI	3-6	Database Search	IOC, VOC, SOC
91	cercla - FORMER CY DUMP :Permit Holder	3-6	Database Search	IOC, VOC, SOC
94	rcris	3-6	Database Search	IOC, VOC
97	SARA - PETROLEUM BULK STATIONS & TERM	3-6	Database Search	VOC, SOC
101	SARA - PETROLEUM BULK STATIONS & TERM	3-6	Database Search	VOC, SOC
103	SARA - GASOLINE SERVICE STATIONS	3-6	Database Search	IOC, VOC, SOC
104	SARA - FARM SUPPLIES	3-6	Database Search	IOC, VOC, SOC

Site	Source Description[1]	TOT[2] Zone	Source of Information	Potential Contaminants[3]
105	SARA - MISCELLANEOUS RETAIL STORES	3-6	Database Search	IOC, VOC, SOC
106, 107	LUST - Site Cleanup Completed , Impact: Unknown; UST - Closed	6-10	Database Search	VOC, SOC
108	Dairy - 201-500 cows	6-10	Database Search	IOC
109	Dairy - <=200 cows	6-10	Database Search	IOC
	Highway 25	0-3	GIS Map	IOC, VOC, SOC, Microbials
	Highway 24/30	3-6	GIS Map	IOC, VOC, SOC
	Snake River	6-10	GIS Map	IOC, VOC, SOC

[1]LUST = leaking underground storage tank, UST = underground storage tank , WLAP = wastewater land application site, NPDES = national pollution discharge elimination system, RCRIS = resource conservation and recovery information system, CERCLIS = comprehensive environmental response compensation and liability information system, TRI = toxic release inventory, SARA = superfund amendments reauthorization act,
[2] TOT = time-of-travel (in years) for a potential contaminant to reach the wellhead
[3] IOC = inorganic chemical, VOC = volatile organic chemical, SOC = synthetic organic chemical

Appendix B

Amalgamated Sugar Plant, Paul
Susceptibility Analysis
Worksheet

The final scores for the susceptibility analysis were determined using the following formulas:

1) VOC/SOC/IOC Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.2)

2) Microbial Final Score = Hydrologic Sensitivity + System Construction + (Potential Contaminant/Land Use x 0.35)

Final Susceptibility Scoring:

0 - 5 Low Susceptibility

6 - 12 Moderate Susceptibility

≥ 13 High Susceptibility

Ground Water Susceptibility Report   Public Water System Name : AMALGAMATED SUGAR PAUL   Well# : WELL

Public Water System Number 5340002   11/5/2001 7:35:40 AM

1. System Construction

		SCORE
Drill Date	9/11/1953	
Driller Log Available	YES	
Sanitary Survey (if yes, indicate date of last survey)	YES	1995
Well meets IDWR construction standards	NO	1
Wellhead and surface seal maintained	YES	0
Casing and annular seal extend to low permeability unit	NO	2
Highest production 100 feet below static water level	YES	0
Well located outside the 100 year flood plain	YES	0
Total System Construction Score		3

2. Hydrologic Sensitivity

Soils are poorly to moderately drained	YES	0
Vadose zone composed of gravel, fractured rock or unknown	NO	0
Depth to first water > 300 feet	NO	1
Aquitard present with > 50 feet cumulative thickness	YES	0
Total Hydrologic Score		1

3. Potential Contaminant / Land Use - ZONE 1A

		IOC Score	VOC Score	SOC Score	Microbial Score
Land Use Zone 1A	IRRIGATED CROPLAND	2	2	2	2
Farm chemical use high	YES	2	0	2	
IOC, VOC, SOC, or Microbial sources in Zone 1A	NO	NO	NO	NO	NO
Total Potential Contaminant Source/Land Use Score - Zone 1A		4	2	4	2

Potential Contaminant / Land Use - ZONE 1B

		IOC	VOC	SOC	Microbial
Contaminant sources present (Number of Sources)	YES	3	5	5	2
(Score = # Sources X 2) 8 Points Maximum		6	8	8	4
Sources of Class II or III leacheable contaminants or	YES	4	5	2	
4 Points Maximum		4	4	2	
Zone 1B contains or intercepts a Group 1 Area	YES	2	0	0	0
Land use Zone 1B	Greater Than 50% Irrigated Agricultural Land	4	4	4	4
Total Potential Contaminant Source / Land Use Score - Zone 1B		16	16	14	8

Potential Contaminant / Land Use - ZONE II

		IOC	VOC	SOC	Microbial
Contaminant Sources Present	YES	2	2	2	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Land Use Zone II	Greater Than 50% Irrigated Agricultural Land	2	2	2	
Potential Contaminant Source / Land Use Score - Zone II		5	5	5	0

Potential Contaminant / Land Use - ZONE III

		IOC	VOC	SOC	Microbial
Contaminant Source Present	YES	1	1	1	
Sources of Class II or III leacheable contaminants or	YES	1	1	1	
Is there irrigated agricultural lands that occupy > 50% of	NO	0	0	0	
Total Potential Contaminant Source / Land Use Score - Zone III		2	2	2	0
Cumulative Potential Contaminant / Land Use Score		27	25	25	10

4. Final Susceptibility Source Score

	IOC	VOC	SOC	Microbial
4. Final Susceptibility Source Score	9	9	9	8
5. Final Well Ranking	Moderate	Moderate	Moderate	Moderate